

Serial No. 10/771,047 ..... Page 7

### REMARKS

Claims 1, 5 – 8, 10, 11, 13, 16, 17, 20 – 24, 26 – 29, 31 – 40, 43 – 53, 55, 56 and 64 – 73 are presently pending. Claims 10, 11, 13 and 56 have been withdrawn from consideration. Claim 52 and 53 were rejected under 35 U.S.C. § 112, second paragraph. Claim 22 was rejected under 37 CFR 1.75. Claims 1, 5 – 8, 10, 11, 13, 16, 17, 20 – 24, 26 – 29, 31 – 40, 43 – 53, 55, 56 and 64 – 73 were rejected.

For the reasons set forth more fully below, Applicants respectfully submit that the present application properly presents Claims patentable over the prior art. Reconsideration, allowance and passage to issue are respectfully requested.

The present invention addresses the need in the art for an eye-safe, high-quality, robust, cost-effective, compact, and light-weight laser that is readily scalable to high average power and high pulse energy and for a unique phase-locking system that can efficiently combine arbitrary numbers of fiber laser oscillator outputs without requiring precise fiber length equalization or stringent periodic positioning.

The need in the art is addressed by the inventive laser which includes plural fiber laser oscillators, high-power laser pump sources coupled to said fiber laser resonators, and a cavity external to the fiber laser oscillators coherently combines plural laser beams output from the plural fiber laser oscillators into a single output laser beam. The invention is set forth in Claims of varying scope of which Claim 1, as amended, is illustrative. Claim 1 now recites:

Serial No. 10/771,047 ..... Page 8

1. A robust scalable eye-safe laser system comprising:
  - a plurality of laser fibers;
  - a high-power laser pump source coupled to each of said laser fibers; and
  - an external cavity having an optical axis, and beam-flattening optics for flattening individual Gaussian-like TEM<sub>00</sub> beams into top hat laser beams and forming a combined beam symbolized by a random phase and amplitude multiple beam profile, said external cavity having a first lens, a single aperture, a second lens and a mirror located along the optical axis, said single aperture being of predetermined diameter and being located at focal points of the first and the second lenses. (Emphasis added.)

(The new language in Claim 1 is supported in the subject Specification. For example, see page 13, lines 13 – 15.)

None of the references, taken alone or in combination, teach or render obvious the invention as presently claimed. That is, none of the references, taken alone or in combination, teach or render obvious a laser system having plural fiber laser resonators, high power pump sources coupled to the fiber laser resonators, an external cavity for combining the outputs thereof into a single output beam and **beam flattening optics for flattening individual Gaussian-like TEM<sub>00</sub> beams into top hat laser beams and forming a combined beam symbolized by a random phase and amplitude multiple beam profile** as presently claimed.

In the above-identified Office Action, the Examiner rejected Claims 1 and 5 – 7 under 35 U.S.C. § 103(a) as being unpatentable over Corcoran in view of Feillens *et al.* and further in view of Kliner *et al.* In this connection, the Examiner asserted that Corcoran discloses, *inter alia*, beam flattening optics by virtue of the collimating lens thereof. However, this assertion is untenable.

The mere collimation of a beam is not equivalent to flattening individual Gaussian-like TEM<sub>00</sub> beams into top hat laser beams and forming a combined beam symbolized by a random phase and amplitude multiple beam profile as presently claimed. Hence, Corcoran clearly does not teach beam flattening optics as previously or currently claimed.

Serial No. 10/771,047 ..... Page 9

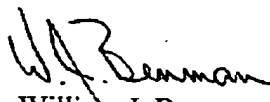
Further, inasmuch as the shortcomings of Corcoran are not overcome by the teachings of Feillens *et al.* or Kliner, Claims 1 and 29 and the Claims dependent thereon should be allowable.

The objection to Claim 22 is obviated by the amendments to Claim 1 and the remaining rejected Claims have been canceled without prejudice.

Accordingly, the present Claims should be allowable. Allowance and passage to issue are respectfully requested.

Respectfully submitted,  
K. Spariosu *et al.*

By

  
William J. Benman  
Attorney for Applicants  
Registration No. 29,014

WJB/ns

Benman, Brown & Williams  
2049 Century Park East  
Suite 2740  
Los Angeles, CA 90067

(310) 553-2400  
(310) 553-2675 facsimile